

## G01C

**MEASURING DISTANCES, LEVELS OR BEARINGS; SURVEYING; NAVIGATION; GYROSCOPIC INSTRUMENTS; PHOTOGRAMMETRY OR VIDEOGRAMMETRY (measuring dimensions or angles of objects [G01B](#); measuring liquid level [G01F](#); measuring intensity or direction of magnetic fields, other than the earth's field, in general [G01R](#); radio navigation, determining distance or velocity by use of propagation effects, e.g. Doppler effects, propagation time, of radio waves, analogous arrangements using other waves [G01S](#); optical systems therefor [G02B](#); maps, globes [G09B](#))**

### Definition statement

*This place covers:*

Devices, systems and methods for measuring distances, levels or bearings, for surveying, for photogrammetry or videogrammetry, for navigation; Gyroscopes and other turn-sensitive devices used as sensors. The subclass coverage includes:

- Compasses in general;
- Gyroscopes and other turn-sensitive devices used as sensors, e.g. optical gyrometers using the Sagnac effect;
- Optical rangefinders;
- Instruments, systems and methods for tracing profiles, for photogrammetry, for surveying, for nautical, aeronautical, cosmonautical, or geodetical measuring of distances, levels, heights, angles, inclinations and bearings, for land, sea, air or cosmonautical navigation, for measuring two or more variables of movement, e.g. distance, speed, acceleration;
- Manufacturing, calibrating, maintaining the previously listed elements.

### Relationships with other classification places

The general subject matters of determining length, distance, height, level, direction, movement or angle is covered by several subclasses besides [G01C](#):

- [G01B](#) measuring length, thickness, or similar linear dimensions, measuring angles; measuring areas; measuring irregularities of surfaces or contours (of individual objects)
- [G01P](#) measuring linear or angular speed, acceleration, deceleration, or shock; indicating presence, absence, or direction, of movement
- [G01S](#) radio direction finding; radio navigation; determining distance or velocity by use of radio waves; locating or presence detecting by use of the reflection or reradiation of radio waves; analogous arrangements using other waves (by use of propagation effects - e.g. Doppler effect, propagation time -)
- When propagation effects of waves are relevant for such measurements [G01S](#) is in general the appropriate subclass.

For measuring ground distance between points in geodesy, surveying, and navigation or for measuring distance traversed on the ground by any moving objects including e. g. vehicles, or persons [G01C](#) is the appropriate subclass when no radio waves are used or when propagation effects of waves other than radio waves are not relevant.

### References

#### Limiting references

*This place does not cover:*

Measuring liquid level	<a href="#">G01F</a>
Traffic control systems	<a href="#">G08G</a>

### Informative references

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

Arrangements of nautical instruments or navigational aids for ships	<a href="#">B63B 49/00</a>
Marking of navigation routes for ships other than with buoys	<a href="#">B63B 51/00</a>
Arrangements or adaptations of instruments for aircrafts	<a href="#">B64D 43/00</a>
Aiming means with range finders	<a href="#">F41G 3/00</a>
Measuring speed by using the gyroscopic effect	<a href="#">G01P 9/00</a>
Measuring acceleration, deceleration, shock by making use of gyroscopes	<a href="#">G01P 15/14</a>
Arrangements or instruments for measuring magnetic variables (Measuring intensity or direction of magnetic fields, other than the earth's field, in general)	<a href="#">G01R 33/00</a>
Measuring magnetic field characteristics of the earth, e.g. declination, deviation for purposes other than navigation, surveying	<a href="#">G01V 3/00</a>
Rangefinders coupled with focussing arrangements of cameras	<a href="#">G03B 13/20</a>
Stereoscopic photography	<a href="#">G03B 35/00</a>
Photographing extended surfaces, e.g. Surveying cameras	<a href="#">G03B 37/00</a>
Taximeter	<a href="#">G07B 13/00</a>
Registering or indicating the working of vehicles	<a href="#">G07C 5/00</a>
Traffic control systems for road vehicles involving transmission of navigation instructions to the vehicle	<a href="#">G08G 1/0968</a>
Maps, globes	<a href="#">G09B</a>
Models or demonstration devices for surveying	<a href="#">G09B 25/06</a>

### Glossary of terms

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

Navigation	means determining the position and course of humans, land vehicles, ships, aircraft, and space vehicles
Propagation effects	are relevant if the outcome of a measurement depends on the actual value of a physical quantity characterising the propagation of the wave, i.e. its wavelength, frequency, velocity, or phase. The mere presence or direction of a wave are not considered a propagation effect or to contribute to a propagation effect. To put it in another way, propagation effects are irrelevant, if the radiation may be looked upon as a beam of radiation whose wave nature can be ignored. Examples of measurements where propagation effects are relevant include e.g. measurements of propagation time, phase difference, phase delay, measurements using the Doppler effect, or interference.

## G01C 1/00

### Measuring angles (in compasses [G01C 17/00](#))

#### Definition statement

*This place covers:*

Methods and devices for measuring angles using theodolites and sextants, for surveying or navigation

#### References

##### Limiting references

*This place does not cover:*

Measuring angles or tapers of objects	<a href="#">G01B</a>
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##### 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:*

Measuring angles in compasses	<a href="#">G01C 17/00</a>
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## G01C 1/02

### Theodolites

#### References

##### Informative references

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

Imaging systems using optical elements for stabilisation of the lateral and angular position of the image, compensating for small deviations, e.g. due to vibration or shake, for automatically maintaining a reference alignment, e.g. in self-levelling surveying instruments	<a href="#">G02B 27/648</a>
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#### Glossary of terms

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

Transit	Theodolite which has a telescope which can be rotated 180 degrees around the horizontal (trunnion) axis
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## G01C 1/06

### Arrangements for reading scales (in general [G01D](#))

#### References

##### Informative references

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

Arrangements for reading scales in general	<a href="#">G01D</a>
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**G01C 1/10**

including an artificial horizon ([G01C 1/14](#) takes precedence; artificial horizons per se [G01C 15/14](#))

**References****Limiting references**

*This place does not cover:*

Periscopic sextants	<a href="#">G01C 1/14</a>
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**Informative references**

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

Artificial horizons per se	<a href="#">G01C 15/14</a>
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**G01C 3/00**

Measuring distances in line of sight; Optical rangefinders (tapes, chains or wheels for measuring length [G01B](#); coupling rangefinders with operating parts of photographic apparatus [G03B](#))

**Definition statement**

*This place covers:*

Devices and methods for measuring distances in line of sight and optical rangefinders.

**References****Limiting references**

*This place does not cover:*

Tapes, chains or wheels for measuring length	<a href="#">G01B</a>
Active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves	<a href="#">G01S 17/48</a>

**Informative references**

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

Inter car distance or car rail distance	<a href="#">G01C 3/22</a>
Anti-slumber devices for car drivers	<a href="#">B60K</a>
Pulsed systems	<a href="#">G01S 17/10</a>
Measuring distances using phase differences	<a href="#">G01S 17/36</a>
Range finding by comparing magnitude of image of object to fiducial mark	<a href="#">G02B 27/32</a>
Coupling rangefinders with operating parts of photographic apparatus	<a href="#">G03B</a>
Range finding by image processing	<b><a href="#">G06F15/70</a></b>

## G01C 3/04

**Adaptation of rangefinders for combination with telescopes or binoculars (rangefinders coupled with focussing arrangements of cameras [G03B 13/20](#))**

### References

#### *Informative references*

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

Rangefinders coupled with focussing arrangements of cameras	<a href="#">G03B 13/20</a>
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## G01C 3/085

**{with electronic parallax measurement}**

### References

#### *Informative references*

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

Scene trackers using image correlation	<a href="#">G01S 3/7865</a>
Ranging using stereo images	<a href="#">G01S 11/12</a>

### Glossary of terms

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

Parallax	the angle subtended at an observation point by the two ends of a line section
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## G01C 3/10

**using a parallactic triangle with variable angles and a base of fixed length in the observation station, e.g. in the instrument (active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves, [G01S 17/48](#))**

### References

#### *Limiting references*

*This place does not cover:*

Active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves	<a href="#">G01S 17/48</a>
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**G01C 3/22**

using a parallax triangle with variable angles and a base of fixed length at, near, or formed by the object (active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves, [G01S 17/48](#))

**References****Limiting references**

*This place does not cover:*

Active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves	<a href="#">G01S 17/48</a>
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**Informative references**

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

Optical viewing arrangements for vehicles	<a href="#">B60R 1/00</a>
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**G01C 3/24**

using a parallax triangle with fixed angles and a base of variable length in the observation station, e.g. in the instrument (active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves, [G01S 17/48](#))

**References****Limiting references**

*This place does not cover:*

Active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves	<a href="#">G01S 17/48</a>
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**G01C 3/26**

using a parallax triangle with fixed angles and a base of variable length, at, near, or formed by the object (active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves, [G01S 17/48](#))

**References****Limiting references**

*This place does not cover:*

Active triangulation systems, i.e. using the transmission and reflection of electromagnetic waves other than radio waves	<a href="#">G01S 17/48</a>
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## G01C 5/00

**Measuring height; Measuring distances transverse to line of sight; Levelling between separated points; Surveyors' levels ([G01C 3/20](#), [G01C 3/30](#) take precedence; tracing profiles [G01C 7/00](#); levels indicating inclination at a single point [G01C 9/00](#))**

### Definition statement

*This place covers:*

Methods and devices for measuring height, measuring distances transverse to line of sight, levelling between separated points and surveyor's levels for navigational or surveying purposes

### References

#### Limiting references

*This place does not cover:*

Measuring of distances to an object using a parallactic triangle with variable angles and a base of fixed length in the observation station, with adaptation to the measurement of the height of an object	<a href="#">G01C 3/20</a>
Measuring of distances to an object using a parallactic triangle with fixed angles and a base of variable length at or near the object, with adaptation to the measurement of the height of an object, e.g. tacheometers	<a href="#">G01C 3/30</a>

#### Informative references

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

Tracing profiles	<a href="#">G01C 7/00</a>
Levels indicating inclination at a single point	<a href="#">G01C 9/00</a>

## G01C 5/005

**{altimeters for aircraft ([G01C 5/02](#), [G01C 5/06](#) take precedence)}**

### References

#### Informative references

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

Ground Proximity Warning Systems	<a href="#">B64D 45/04</a>
Devices characterised by the determination of the variation of atmospheric pressure with height to measure the vertical components of speed (variometer)	<a href="#">G01P 3/62</a>

## G01C 5/02

involving automatic stabilisation of the line of sight; (tilt compensation in general [G12B](#); regulation of direction in general [G05D 3/00](#))

### References

#### Informative references

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

Regulation of direction in general	<a href="#">G05D 3/00</a>
Tilt compensation in general	<a href="#">G12B 5/00</a>

## G01C 5/06

by using barometric means (barometers per se [G01L](#))

### Definition statement

*This place covers:*

Methods and devices for measuring height or distances transverse to line of sight, levelling between separated points and surveyors' levels using barometric means, e.g. depth gauges for divers of e.g. the wrist-watch type.

### References

#### Informative references

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

Divers' equipment in general	<a href="#">B63C 11/00</a>
Barometers per se	<a href="#">G01L</a>
Wrist watches with external data detectors	<b>G04G1/04</b>

## G01C 7/00

Tracing profiles (by photogrammetry [G01C 11/00](#))

### Definition statement

*This place covers:*

Devices and methods for tracing profiles of large surfaces such as land surfaces or underground surfaces.

### References

#### Limiting references

*This place does not cover:*

Tracing profiles using photogrammetry	<a href="#">G01C 11/00</a>
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**Informative references**

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

Measuring irregularity or unevenness of surfaces on a small scale	<a href="#">G01B</a>
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**G01C 7/02**

of land surfaces

**References****Informative references**

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

Checking of the level of roads	<a href="#">E01C 23/01</a>
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**G01C 7/06**

of cavities, e.g. tunnels (survey of wells [E21B 47/00](#))

**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:

Survey of wells	<a href="#">E21B 47/00</a>
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**Informative references**

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

Measuring apparatus or devices for track building purposes	<a href="#">E01B 35/00</a>
Arrangement of measuring or indicating devices for use during driving of tunnels, using light beams for direction or position control	<a href="#">E21D 9/004</a>

**G01C 9/00**

Measuring inclination, e.g. by clinometers, by levels {(switches operated by inclination or orientation [H01H 35/02](#))}

**References****Limiting references**

This place does not cover:

Switches operated by inclination or orientation	<a href="#">H01H 35/02</a>
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**Informative references**

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

Spirit levels combined with laser plumbing or levelling	<a href="#">G01C 15/008</a>
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Devices for positioning picture hooks on a wall	<a href="#">A47G 1/205</a>
Circuits for registering vehicle tilting or roll over	<a href="#">B60R 16/0233</a>
Inclinometers for ladders	<a href="#">E06C 7/003</a>

## G01C 9/10

by using rolling bodies {, e.g. spheres, cylinders, mercury droplets (tilting mercury container switches [H01H 29/20](#))}

### Definition statement

*This place covers:*

Devices and methods for measuring inclination by using rolling bodies, also including sliding bodies.

### References

#### Limiting references

*This place does not cover:*

Tilting mercury container switches	<a href="#">H01H 29/20</a>
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#### Informative references

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

Spirit levels combined with laser plumbing or levelling	<a href="#">G01C 15/008</a>
Devices for positioning picture hooks on a wall	<a href="#">A47G 1/205</a>
Circuits for registering vehicle tilting or roll over	<a href="#">B60R 16/0233</a>
Tell tale tilt indicators for proving inversion of goods during transport	<a href="#">B65D 79/02</a>
Inclinometers for ladders	<a href="#">E06C 7/003</a>

## G01C 9/12

by using a single pendulum (plumb lines [G01C 15/10](#))

### References

#### Limiting references

*This place does not cover:*

Plumb lines	<a href="#">G01C 15/10</a>
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#### Informative references

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

Vehicle anti theft means	<a href="#">B60R 25/1006</a>
Tell tale tilt indicators for proving inversion of goods during transport	<a href="#">B65D 79/02</a>

**G01C 9/20**

the indication being based on the inclination of the surface of a liquid relative to its container

**References****Informative references**

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

Liquid level measurements	<a href="#">G01F 23/00</a>
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**G01C 9/28****Mountings****References****Informative references**

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

Inclinometers mounted to golf clubs for driving or putting	<a href="#">A63B 69/3632</a> , <a href="#">A63B 69/3685</a>
Guiding hand tools by means of levels	<a href="#">B25H 1/0085</a>

**G01C 9/32**

Means for facilitating the observation of the position of the bubble, e.g. illuminating means

**Definition statement**

*This place covers:*

Means for facilitating the observation of the position of the bubble by human observers.

**References****Informative references**

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

Inclinometers mounted to golf clubs for driving or putting	<a href="#">A63B 69/3632</a> , <a href="#">A63B 69/3685</a>
Guiding hand tools by means of levels	<a href="#">B25H 1/0085</a>

## G01C 11/00

**Photogrammetry or videogrammetry, e.g. stereogrammetry; Photographic surveying (cameras combined with surveying instruments, e.g. with theodolites, [G01C 1/00](#), [G01C 3/00](#), [G01C 5/00](#), [G01C 9/00](#); surveying cameras [G03B 37/00](#))**

### Definition statement

*This place covers:*

Methods and devices for photogrammetry or videogrammetry and photographic surveying

### References

#### Informative references

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

Earth observation satellites	<a href="#">B64G 1/1021</a>
Cameras combined with surveying instruments	<a href="#">G01C 1/00</a> , <a href="#">G01C 3/00</a> , <a href="#">G01C 5/00</a> , <a href="#">G01C 9/00</a>
SAR imaging	<a href="#">G01S 13/90</a>
Photographic aspects also	<a href="#">G03B 35/00</a> , <a href="#">G03B 15/00</a>
Surveying cameras	<a href="#">G03B 37/00</a>
Mosaicking of surveyed images	<a href="#">G06K 9/00</a>
3D Geographic Models	<a href="#">G06T 17/05</a>
Depth or shape recovery using image analysis	<a href="#">G06T 7/50</a>

### Special rules of classification

IPC group **G01C11/36** is not used. Subject matter covered by this group is classified in [G01C 11/00-G01C 11/34](#).

## G01C 11/02

**Picture taking arrangements specially adapted for photogrammetry or photographic surveying, e.g. controlling overlapping of pictures**

### Definition statement

*This place covers:*

Special picture taking arrangements adapted to methods and devices for photogrammetry or videogrammetry and photographic surveying, including orthorectification.

## G01C 11/04

**Interpretation of pictures**

### Definition statement

*This place covers:*

Subject-matter related to the interpretation of pictures in methods and devices for photogrammetry or videogrammetry and photographic surveying, including means for interpretation, such as mensuration tables or reseaux.

## G01C 11/06

by comparison of two or more pictures of the same area

### Definition statement

*This place covers:*

Subject-matter related to the interpretation of pictures by comparison of two or more pictures of the same area in methods and devices for photogrammetry or videogrammetry and photographic surveying, e.g. stereo-photogrammetry

### References

#### Informative references

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

Ranging using stereo images	<a href="#">G01S 11/12</a>
Depth from stereo vision	<a href="#">G06T 7/593</a>

## G01C 13/00

Surveying specially adapted to open water, e.g. sea, lake, river, canal (liquid level metering [G01F](#); measuring liquid velocity [G01P](#); determining existence of flow of underground water [G01V](#))

### Definition statement

*This place covers:*

All kinds of surveying instruments or accessories which are not provided for in the preceding groups [G01C 1/00](#) - [G01C 13/00](#).

### References

#### Limiting references

*This place does not cover:*

Liquid level metering	<a href="#">G01F</a>
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#### Informative references

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

Buoys	<a href="#">B63B 22/00</a>
Oceanography	<a href="#">B63B 2211/02</a>
Measuring liquid velocity	<a href="#">G01P</a>
Determining existence of flow of underground water	<a href="#">G01V 9/02</a>

**G01C 13/008****{measuring depth of open water}****Definition statement***This place covers:*

Measuring the distance between the water surface and the water bed.

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

Measuring instantaneous depth of diver	<a href="#">G01C 5/06</a>
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**Informative references***Attention is drawn to the following places, which may be of interest for search:*

Buoys	<a href="#">B63B 22/00</a>
Oceanography	<a href="#">B63B 2211/02</a>

**G01C 15/00****Surveying instruments or accessories not provided for in groups****[G01C 1/00](#) - [G01C 13/00](#)****Definition statement***This place covers:*

All kinds of surveying instruments or accessories which are not provided for in the preceding groups

[G01C 1/00](#) - [G01C 13/00](#).**References****Limiting references***This place does not cover:*

Measuring angles	<a href="#">G01C 1/00</a>
Surveying specially adapted to open water, e.g. sea, lake, river, canal	<a href="#">G01C 13/00</a>

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

Marking of work pieces	<a href="#">B25H 7/00</a>
Surveying of railway tracks	<a href="#">E01B 35/00</a>
Paving machines	<a href="#">E01C 19/00</a>
Guiding the machines along a predetermined path	<a href="#">E01C 19/004</a>
By laser or ultrasound	<a href="#">E01C 19/006</a>
By reference lines placed along the road, e.g. wires	<a href="#">E01C 19/008</a>
Finishing floors or ceilings	<a href="#">E04F 15/00</a> , <a href="#">E04F 21/00</a>

Holders for bricklayers' lines	<a href="#">E04G 21/1808</a>
Tripods	<a href="#">F16M 11/32</a>
Models for surveying	<a href="#">G09B 25/06</a>

### Glossary of terms

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

Optical plumbing	determining the vertical (plumb) using optical means
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## G01C 15/002

{Active optical surveying means (optical plumbing [G01C 15/105](#))}

### References

#### Limiting references

*This place does not cover:*

Optical plumbing	<a href="#">G01C 15/105</a>
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#### Informative references

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

Marking of work pieces	<a href="#">B25H 7/00</a>
Surveying of railway tracks	<a href="#">E01B 35/00</a>
Paving machines	<a href="#">E01C 19/00</a>
Guiding the machines along a predetermined path	<a href="#">E01C 19/004</a>
By laser or ultrasound	<a href="#">E01C 19/006</a>
By reference lines placed along the road, e.g. wires	<a href="#">E01C 19/008</a>
Finishing floors or ceilings	<a href="#">E04F 15/00</a> , <a href="#">E04F 21/00</a>
Holders for bricklayers' lines	<a href="#">E04G 21/1808</a>
Tripods	<a href="#">F16M 11/32</a>
Models for surveying	<a href="#">G09B 25/06</a>

### Glossary of terms

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

Active optical surveying means	surveying means using at least one propagation property of at least one light source
Total stations	theodolites with an electronic distance measuring capability, usually in the form of a laser ranging device

## G01C 15/004

{Reference lines, planes or sectors}

### Definition statement

*This place covers:*

Generating a reference line, plane or sector by active optical means.

Measuring or comparing shortest distance (i.e. along the perpendicular) to the reference line, plane or sector.

### References

#### Informative references

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

Earth moving equipment using laser planes	<a href="#">E02F 3/847</a>
Beam shaping	<a href="#">G02B 27/09</a>
Self levelling surveying instruments	<a href="#">G02B 27/648</a>

## G01C 15/008

{combined with inclination sensor}

### Relationships with other classification places

[G01C 15/008](#) covers surveying means whereby the inclination sensors are intended to be used as such; Surveying means having inclination sensors inside, merely to define the inclination of the reference plane, are covered by [G01C 15/004](#).

## G01C 15/02

Means for marking measuring points

### References

#### Informative references

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

Devices for positioning picture hooks on a wall	<a href="#">A47G 1/205</a>
Means for marking work	<a href="#">B25H 7/04</a>
Markings on roads, e.g. paint	<a href="#">E01C 23/16</a>
Bollards	<a href="#">E01F 9/60</a> , <a href="#">E01F 15/0469</a>
Transponders for markers	<a href="#">G06K 7/08</a> , <a href="#">G01S 13/02</a> , <a href="#">G08B 13/24</a>



## G01C 15/06

### Surveyors' staffs; Movable markers

#### Definition statement

*This place covers:*

Surveyor's staffs or movable markers as means for marking measuring points in surveying methods.

#### References

##### Informative references

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

Tripods	<a href="#">F16M 11/32</a>
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## G01C 15/10

### Plumb lines

#### References

##### Informative references

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

Chalk lines also	<a href="#">B44D 3/38</a>
Cable pay-out	<a href="#">B65H 75/44</a>

## G01C 15/105

### {Optical plumbing}

#### References

##### Informative references

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

Chalk lines also	<a href="#">B44D 3/38</a>
Cable pay-out	<a href="#">B65H 75/44</a>

## G01C 17/00

### Compasses; Devices for ascertaining true or magnetic north for navigation or surveying purposes (using gyroscopic effect [G01C 19/00](#); for geophysical or prospecting purposes [G01V 3/00](#))

#### Definition statement

*This place covers:*

Compasses and devices for ascertaining true or magnetic North for the purpose of navigation or surveying, including magnetic compasses, sun and astro compasses, methods and arrangements for testing, calibrating or compensating of such compasses and devices and repeaters for remote indication of readings of a master compass.

## References

### Limiting references

*This place does not cover:*

Devices for finding North using gyroscopic effect	<a href="#">G01C 19/34</a> , <a href="#">G01C 19/36</a> , <a href="#">G01C 19/38</a>
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### Informative references

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

For geophysical or prospecting purposes	<a href="#">G01V 3/00</a>
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## G01C 17/28

**Electromagnetic compasses (with north seeking magnetic elements and having electric pick-offs [G01C 17/26](#))**

## References

### Limiting references

*This place does not cover:*

With north seeking magnetic elements and having electric pick-offs	<a href="#">G01C 17/26</a>
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### Informative references

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

HALL effect sensors	<a href="#">G01R 33/07</a>
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## G01C 17/30

**Earth-inductor compasses**

### Definition statement

*This place covers:*

Fluxgates, these being instruments in which a core is saturated by the strong flux of an ac driving coil, the bias of the saturation being set by the earth's magnetic field.

Rotating induction coils.

## References

### Informative references

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

Prayer rugs	<a href="#">A47G 27/0237</a> , <a href="#">A47G 33/00</a>
HALL effect sensors	<a href="#">G01R 33/07</a>

## G01C 17/34

### Sun- and astro-compasses

#### References

##### Informative references

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

Time-pieces using the position of the sun, moon or stars	<a href="#">G04B 49/00</a>
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## G01C 19/00

### Gyroscopes; Turn-sensitive devices using vibrating masses; Turn-sensitive devices without moving masses; Measuring angular rate using gyroscopic effects

#### Definition statement

*This place covers:*

Gyroscopic sensors, i.e gyroscopes, turn-sensitive devices with or without vibrating/moving masses that are intended for sensing and outputting inertial rotation angles, angular velocity or bearings.

#### Relationships with other classification places

Gyroscopes for sensing are covered here.

Gyroscopes, used as actuators for stabilisation or movement purposes by means of their angular momentum are not covered in [G01C 19/00](#) but in their particular fields, e.g:

- Land vehicle stabilisation using gyroscopes [B62D 37/06](#);
- Ship stabilisation using gyroscopes [B63B 39/04](#);
- Gyros used as motors or actuators [F03G 3/08](#);
- Educational demonstration models of gyroscopic actuators [G09B 23/00](#), [G09B 25/00](#);
- Control Moment Gyroscopes for space vehicles [B64G 1/28](#).

#### References

##### Informative references

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

Gimbals, not especially for gyroscopes	<a href="#">F16M 11/12</a>
Educational demonstration models of gyroscopes	<a href="#">G09B 23/00</a> , <a href="#">G09B 25/00</a>

## G01C 19/025

### {Special arrangements for gyros functioning during a short period}

#### Definition statement

*This place covers:*

Details about particular arrangements for rotary gyroscopes functioning during a short period, e.g. in guided missiles, torpedoes, etc., wherein the gyro rotor must be brought up to operational speed in a very short time.

## References

### Informative references

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

Target seeking gyro	<a href="#">F41G 7/2213</a>
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## G01C 19/065

{Measurement or control of angular velocity, specifically adapted to gyrorotors (measuring angular speed in general [G01P](#); controlling angular speed [G05D 13/00](#); controlling electrical motors [H02P](#))}

### Definition statement

This place covers:

Details about particular devices or methods for measuring and/or controlling the angular speed of rotors of rotary gyroscopes for specific purposes.

## References

### Informative references

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

Measuring angular speed in general	<a href="#">G01P</a>
Controlling angular speed	<a href="#">G05D 13/00</a>
Controlling electrical motors	<a href="#">H02P</a>

## G01C 19/08

electrically driven ([G01C 19/14](#) takes precedence; dynamoelectric machines [H02K](#))

## References

### Limiting references

This place does not cover:

Fluid rotors	<a href="#">G01C 19/14</a>
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### Informative references

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

Dynamoelectric machines	<a href="#">H02K</a>
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## G01C 19/16

**Suspensions; Bearings (bearings in general [F16C](#); balancing rotors [G01M](#))**

### References

#### *Informative references*

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

Bearings in general	<a href="#">F16C</a>
Balancing rotors	<a href="#">G01M</a>

## G01C 19/22

**torsional**

### Definition statement

*This place covers:*

Details about suspensions of elements of rotary gyroscopes, wherein the suspensions are of the torsional type.

### References

#### *Informative references*

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

Flexure pivots	<a href="#">F16C 11/12</a>
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## G01C 19/30

**Erection devices, i.e. devices for restoring rotor axis to a desired position (for instrument indicating the vertical [G01C 19/46](#))**

### References

#### *Limiting references*

*This place does not cover:*

Erection devices for instruments indicating the vertical	<a href="#">G01C 19/46</a>
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### Synonyms and Keywords

*In patent documents the expression/word "Torquer" is often used with the meaning erection devices, i.e. devices for restoring rotor axis to a desired position.*

The term "Rebalance" is also often used instead of "Erection"

**G01C 19/32**

**Indicating or recording means specially adapted for rotary gyroscopes (in general [G01D](#))**

**References****Informative references**

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

Measuring not specially adapted for a specific variable; arrangements for measuring two or more variables not covered in a single other subclass; tariff metering apparatus; measuring or testing not otherwise provided for	<a href="#">G01D</a>
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**G01C 19/36**

**with north-seeking action by magnetic means, e.g. gyromagnetic compasses**

**Synonyms and Keywords**

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

- " Meridian- seeking ", and " north-seeking "

**G01C 19/56**

**Turn-sensitive devices using vibrating masses, e.g. vibratory angular rate sensors based on Coriolis forces**

**Definition statement**

*This place covers:*

Turn-sensitive devices using one or more vibrating masses, e.g. vibrating gyros based on Coriolis forces, surface acoustic waves based gyros, sonic or acoustic gyros.

**References****Informative references**

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

Microstructural devices or systems	<a href="#">B81B</a>
Processes or apparatus specially adapted for the manufacture or treatment of microstructural devices or systems	<a href="#">B81C</a>
Piezoelectric devices per se	<a href="#">H01L 41/00</a>
Electromechanical resonators	<a href="#">H03H 9/00</a>

**G01C 19/5607**

using vibrating tuning forks (double-ended tuning forks using planar vibrating masses suspended at opposite ends [G01C 19/5719](#))

**References****Limiting references**

*This place does not cover:*

Double-ended tuning forks using planar vibrating masses suspended at opposite ends	<a href="#">G01C 19/5719</a>
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**G01C 19/5642**

using vibrating bars or beams

**Definition statement**

*This place covers:*

Turn-sensitive devices using one or more vibrating bars or beams undergoing deformations.

**G01C 19/5677**

of essentially two-dimensional vibrators, e.g. ring-shaped vibrators

**Definition statement**

*This place covers:*

Vibrators having their main extension in a plane, i.e with an essentially two-dimensional geometrical structure and using the phase shift of a vibration node or anti-node. The vibrations cover both deformations in the radial direction of the two-dimensional vibrator and deformations perpendicular to the plane of the two-dimensional vibrator.

**G01C 19/5698**

using acoustic waves, e.g. surface acoustic wave gyros

**Definition statement**

*This place covers:*

Both bulk and surface acoustic wave gyros.

**G01C 19/58**

Turn-sensitive devices without moving masses

**Definition statement**

*This place covers:*

All the turn-sensitive devices that do not operate on the basis of vibrating or deforming elements, e.g. gyroscopes using matter-wave interferometers.

**G01C 19/60**

Electronic or nuclear magnetic resonance gyrometers (magnetic resonance arrangements in general [G01R 33/20](#))

**References****Informative references**

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

Magnetic resonance arrangements in general	<a href="#">G01R 33/20</a>
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**G01C 19/66**

Ring laser gyrometers (ring lasers in general [H01S 3/083](#))

**References****Informative references**

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

Ring lasers in general	<a href="#">H01S 3/083</a>
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**G01C 19/662**

{signal readout; dither compensators}

**Definition statement**

*This place covers:*

Ring laser gyrometers having special arrangements for the signal readout or the dither compensation (dither compensators).

**Glossary of terms**

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

Dither compensators	passive optical components placed on the body in a position where the dither signal is cancelled fortuitously
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**G01C 19/664**

{means for removing the dither signal}

**Definition statement**

*This place covers:*

Electronic removal of the dither signal.



**G01C 19/665****{control of the cavity (of lasers in general [H01S 3/10](#))}****Definition statement***This place covers:*

Ring laser gyrometers having special arrangements for controlling the cavity, e.g. by use of piezoelectric mirrors.

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

Lasers in general	<a href="#">H01S 3/10</a>
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**G01C 19/72****with counter-rotating light beams in a passive ring, e.g. fibre laser gyrometers****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Interferometers per se	<a href="#">G01B 9/02</a>
Faraday effect Sagnac interferometers for measuring electrical current	<a href="#">G01R 15/246</a>
Fibre laser emission sources for gyros	<a href="#">H01S 3/06795</a>
Brillouin lasers	<a href="#">H01S 3/30</a>

**G01C 19/721****{Details}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Amplified spontaneous emission sources	<a href="#">H01S3/079</a> and <a href="#">H01S 3/06795</a>
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**G01C 19/722****{of the mechanical construction}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

General winding techniques	<a href="#">B65H</a>
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Bobbin-type optical phase modulators	<a href="#">G02B 26/06</a>
Winding of electrical cable	<a href="#">H02G</a>

## G01C 19/725

{using nxn optical couplers, e.g. 3x3 couplers}

### References

#### Informative references

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

Optical couplers	<a href="#">G02B 6/00</a>
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## G01C 19/727

{using a passive ring resonator}

### Glossary of terms

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

RFOG	Resonant Fibre Optical Gyroscope
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## G01C 21/00

**Navigation; Navigational instruments not provided for in preceding groups (measuring distance traversed on the ground by a vehicle [G01C 22/00](#); measuring linear or angular speed or acceleration [G01P](#); control of position, course, altitude or attitude of vehicles [G05D 1/00](#); traffic control systems [G08G](#))**

### Definition statement

*This place covers:*

Navigation devices, systems and methods

### References

#### Limiting references

*This place does not cover:*

Measuring distance traversed on the ground by a vehicle	<a href="#">G01C 22/00</a>
Measuring linear or angular speed or acceleration	<a href="#">G01P</a>
Control of position, course, altitude or attitude of vehicles	<a href="#">G05D 1/00</a>
Traffic control systems	<a href="#">G08G 1/00</a>

## G01C 21/005

{with correlation of navigation data from several sources, e.g. map or contour matching ([G01C 21/30](#) takes precedence)}

### References

#### Informative references

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

Combined GPS/INS	<a href="#">G01C 21/165</a>
Segmentation of images	<a href="#">G06K 9/34</a>

## G01C 21/02

by astronomical means ([G01C 21/24](#), [G01C 21/26](#) take precedence; measuring time by using position of the sun, moon, or stars [G04B 49/00](#))

### References

#### Limiting references

This place does not cover:

Specially adapted for cosmonautical navigation	<a href="#">G01C 21/24</a>
Specially adapted for navigation in a road network	<a href="#">G01C 21/26</a>

#### Informative references

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

Time-pieces using the position of the sun, moon or stars	<a href="#">G04B 49/00</a>
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## G01C 21/04

by terrestrial means ([G01C 21/24](#), [G01C 21/26](#) take precedence; marking of navigation route for ships [B63B 51/00](#))

### References

#### Limiting references

This place does not cover:

Specially adapted for cosmonautical navigation	<a href="#">G01C 21/24</a>
Specially adapted for navigation in a road network	<a href="#">G01C 21/26</a>

#### Informative references

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

Marking of navigation route for ships	<a href="#">B63B 51/00</a>
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**G01C 21/10**

by using measurements of speed or acceleration ([G01C 21/24](#), [G01C 21/26](#) take precedence)

**References****Limiting references**

*This place does not cover:*

Specially adapted for cosmonautical navigation	<a href="#">G01C 21/24</a>
Specially adapted for navigation in a road network	<a href="#">G01C 21/26</a>

**G01C 21/14**

by recording the course traversed by the object ([G01C 21/16](#) takes precedence)

**References****Limiting references**

*This place does not cover:*

By integrating acceleration or speed, i.e. inertial navigation	<a href="#">G01C 21/16</a>
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**G01C 21/16**

by integrating acceleration or speed, i.e. inertial navigation

**References****Informative references**

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

Vibration damping or isolation	<a href="#">F16F 15/08</a>
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**G01C 21/165**

{combined with non-inertial navigation instruments}

**References****Informative references**

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

Determining position by combining measurements of signals from the satellite radio beacon positioning system with an inertial measurement	<a href="#">G01S 19/47</a> , <a href="#">G01S 19/49</a>
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**G01C 21/18****Stabilised platforms, e.g. by gyroscope****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Stabilisation of surveying instruments	<a href="#">G02B 27/648</a>
Stabilisation of antennae	<a href="#">H01Q 1/18</a>

**G01C 21/20****Instruments for performing navigational calculations ([G01C 21/24](#), [G01C 21/26](#) take precedence; adaptations of digital computers to a specific function or application [G06F 17/00](#), [G06F 19/00](#))****References****Limiting references***This place does not cover:*

Specially adapted for cosmonautical navigation	<a href="#">G01C 21/24</a>
Specially adapted for navigation in a road network	<a href="#">G01C 21/26</a>

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

Marking of navigation route for ships	<a href="#">B63B 51/00</a>
Hand-held measuring wheels for measuring distances on maps	<a href="#">G01B 3/12</a>
Adaptations of digital computers to a specific function or application	<a href="#">G06F 17/00</a> , <a href="#">G06F 19/00</a>
Hand manipulated computing devices for air or sea navigation	<a href="#">G06G 1/0052</a>
Emergency signalling and personal security systems	<a href="#">G08B 25/016</a>

**G01C 21/203****{Specially adapted for sailing ships}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Control of position or course in two dimensions specially adapted to water vehicles	<a href="#">G05D 1/0206</a>
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## G01C 21/22

### Plotting boards (in general [B43L](#))

#### References

##### *Informative references*

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

Plotting boards in general	<a href="#">B43L</a>
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## G01C 21/26

### pecially adapted for navigation in a road network

#### Definition statement

*This place covers:*

Navigation specially adapted for navigation in a road network, whereby the means of transportation is not relevant: the user may be moving on foot, on horseback, on a bicycle, or in or on a motor vehicle of any kind.

#### References

##### *Informative references*

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

Precision agriculture	<a href="#">A01B 79/005</a>
Navigation assistance for the blind or visually impaired	<a href="#">A61H 3/061</a>
Display devices for vehicle air conditioning	<a href="#">B60H 1/00985</a>
Speed or cruise control depending on curves	<a href="#">B60K 31/0066</a>
Headlights adjustable depending on position, curves etc.	<a href="#">B60Q 1/06</a>
Parking assistance	<a href="#">B60Q 1/48</a>
Mechanical construction of the navigation device mounting in a vehicle	<a href="#">B60R 11/0258</a>
Circuits for registering vehicle tilting or roll over	<a href="#">B60R 16/0233</a>
Control of driving parameters	<a href="#">B60T 8/00</a> , <a href="#">B60K 28/10</a> , <a href="#">B62D 6/00</a>
Adaptive cruise control	<a href="#">B60W 30/16</a>
Estimation or calculation of driving parameters for road vehicle drive control systems related to road conditions	<a href="#">B60W 40/06</a>
Lane keeping	<a href="#">B62D 1/28</a> , <a href="#">B60W 30/10</a>
Gear shifting depending on position as determined by navigation system	<a href="#">F16H 61/0213</a>
Hand-held measuring wheels for measuring distances on maps	<a href="#">G01B 3/12</a>
Hand manipulated computing devices for air or sea navigation	<a href="#">G06G 1/0052</a>
GIS Geographic 3D models	<a href="#">G06T 17/05</a>
Taximeters	<a href="#">G07B 13/00</a>
Toll collection	<a href="#">G07B 15/00</a>

Service reminders	<a href="#">G07C 5/006</a> , <a href="#">B60R 16/0234</a>
Data recorders	<a href="#">G07C 5/08</a>
Emergency signalling and personal security systems	<a href="#">G08B 25/016</a>
Traffic information including RDS/TMC	<a href="#">H04H 20/55</a> , <a href="#">G08G 1/091</a> , <a href="#">G08G 1/0968</a>
Locating mobile subscriber using cellular telephony	<a href="#">H04Q7/3855</a> , <a href="#">H04W 64/00</a>
Location based services in a mobile phone network	<a href="#">H04W 4/02</a>

## G01C 21/28

with correlation of data from several navigational instruments

### Definition statement

*This place covers:*

Whereby the several navigational instruments may be similar (simple redundancy) or dissimilar.

## G01C 21/30

Map- or contour-matching

### Synonyms and Keywords

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

- "Contours" and "elevation data/profile"

## G01C 21/32

Structuring or formatting of map data

### References

#### Informative references

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

Geographic Information Systems (GIS) databases	<a href="#">G06F 17/30241</a>
Automatic recognition/extraction of roads or features from maps	<a href="#">G06K 9/00476</a>

## G01C 21/34

Route searching; Route guidance

### References

#### Informative references

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

Optimisation of energy usage for electrical vehicles	<a href="#">B60L 15/2045</a>
Optimisation of routes, e.g. travelling salesman problem	<a href="#">G06Q 10/047</a> , <a href="#">G06Q 10/109</a>

**G01C 21/3407****{specially adapted for specific applications}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Fleet management, taxi dispatching	<a href="#">G08G 1/202</a>
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**G01C 21/3415****{Dynamic re-routing, e.g. recalculating the route when the user deviates from calculated route or after detecting real-time traffic data or accidents}****Definition statement***This place covers:*

The use of route searching in navigation devices, systems or methods for dynamic re-routing, including predictive systems in which alternative routes are calculated even before the user has actually deviated and also routing from a predicted future starting point.

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

The complete route is dynamically recomputed based on new data	<a href="#">G08G 1/096844</a>
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**G01C 21/3461****{Preferred or disfavoured areas, e.g. dangerous zones, toll or emission zones, intersections, manoeuvre types, segments such as motorways, toll roads, ferries}****Definition statement***This place covers:*

Areas disfavoured because of weather conditions, (dis)favouring certain roads because of curves, e.g. for motorcycle (favoured) or towing vehicle (disfavoured), or because of physical requirements (e.g., weight, length, height, width) of non-standard vehicles.

Carpooling/High Occupancy Vehicle restrictions.

Also taking into account whether the user is entitled to use a road or road type (Vignette).

**G01C 21/3476****{using point of interest [POI] information, e.g. a route passing visible POIs}****Glossary of terms***In this place, the following terms or expressions are used with the meaning indicated:*

POI	point of interest
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## G01C 21/3484

{Personalized, e.g. from learned user behaviour or user-defined profiles}

### References

#### Informative references

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

User preferences are taken into account or the user selects one route out of a plurality	<a href="#">G08G 1/096838</a>
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## G01C 21/3492

{employing speed data or traffic data, e.g. real-time or historical (traffic control systems for road vehicles involving transmission of navigation instructions to the vehicle [G08G 1/0968](#))}

### Definition statement

This place covers:

Employing traffic data whereby those traffic data may relate either to the vehicle traffic of the physical vehicle or to the data traffic in mobile communication networks.

### References

#### Informative references

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

Traffic control systems for road vehicles involving transmission of navigation instructions to the vehicle	<a href="#">G08G 1/0968</a>
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## G01C 21/36

Input/output arrangements of navigation systems; {(input arrangements for transferring data to be processed into a form capable of being handled by the computer, and output arrangements for transferring data from processing unit to output unit, e.g. interface arrangements [G06F 3/00](#); pointing devices displaced or positioned by the user, e.g. mice, trackballs, pens or joysticks, and accessories therefor [G06F 3/033](#); interaction techniques for graphical user interfaces, e.g. interaction with windows, icons or menus [G06F 3/048](#); manipulating 3D models or images for computer graphics [G06T 19/00](#))}

### References

#### Informative references

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

Arrangements of vehicle instruments on dashboard	<a href="#">B60K 35/00</a> , <a href="#">B60K 37/02</a>
Mechanical construction of the display mounting in a vehicle	<a href="#">B60R 11/0235</a>
Electric circuits for voice control	<a href="#">B60R 16/0373</a>
Audible indication of meter readings	<a href="#">G01D 7/12</a>

Input arrangements for transferring data to be processed into a form capable of being handled by the computer; Output arrangements for transferring data from processing unit to output unit, e.g. interface arrangements	<a href="#">G06F 3/00</a>
I/O for computers in general	<a href="#">G06F 3/033</a>
Interaction techniques for graphical user interfaces, e.g. interaction with windows, icons or menus	<a href="#">G06F 3/048</a>
Manipulating 3D models or images for computer graphics	<a href="#">G06T 19/00</a>
Voice analysis, synthesis	<a href="#">G10L</a> , <a href="#">G10L 15/265</a>

## G01C 21/3602

{Input other than that of destination using image analysis, e.g. detection of road signs, lanes, buildings, real preceding vehicles using a camera (image data processing per se [G06T](#))}

### References

#### Informative references

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

Image data processing per se	<a href="#">G06T</a>
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## G01C 21/3605

{Destination input or retrieval}

### References

#### Informative references

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

Gesture based interaction between user and computer	<a href="#">G06F 3/017</a>
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## G01C 21/3608

{using speech input, e.g. using speech recognition (speech recognition per se [G10L 15/00](#))}

### References

#### Informative references

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

Speech recognition	<a href="#">G10L 15/00</a>
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**G01C 21/3611**

{using character input or menus, e.g. menus of POIs (character input methods in general [G06F 3/0233](#))}

**References****Informative references**

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

Character input methods	<a href="#">G06F 3/0233</a>
Input is assisted by the navigation device, i.e. the user does not type the complete name of the destination, e.g. using zip codes, telephone numbers, progressively selecting from initial letters	<a href="#">G08G 1/096894</a>

**G01C 21/3617**

{using user history, behaviour, conditions or preferences, e.g. predicted or inferred from previous use or current movement}

**References****Informative references**

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

Input information is obtained using learning systems, e.g. history databases	<a href="#">G08G 1/096888</a>
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**G01C 21/362**

{received from an external device or application, e.g. PDA, mobile phone or calendar application}

**Definition statement**

*This place covers:*

Destinations derived from radio or TV broadcasts.

Destination being the (dynamic) position of a mobile device and received therefrom.

**References****Informative references**

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

Input information is obtained using a mobile device, e.g. a mobile phone, a PDA	<a href="#">G08G 1/096883</a>
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**G01C 21/3626**

{Details of the output of route guidance instructions (traffic control systems for road vehicles involving transmission of navigation instructions to the vehicle [G08G 1/0968](#))}

**Definition statement**

*This place covers:*

Instructions to assist the user to follow the calculated route as well as to warn the user in order to prevent the user from leaving the calculated route.

**References****Informative references**

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

Traffic control systems for road vehicles involving transmission of navigation instructions to the vehicle	<a href="#">G08G 1/0968</a>
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**G01C 21/3629**

{Guidance using speech or audio output, e.g. text-to-speech (text to speech systems per se [G10L 13/00](#))}

**References****Informative references**

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

Instructions are given by voice	<a href="#">G08G 1/096872</a>
Speech systems per se	<a href="#">G10L 13/00</a>

**G01C 21/3632**

{Guidance using simplified or iconic instructions, e.g. using arrows ([G01C 21/365](#) takes precedence)}

**Definition statement**

*This place covers:*

Details on guidance in navigation devices, systems or methods, wherein the guidance uses simplified or iconic instructions, e.g. directional arrows or other symbols, textual instructions.

**References****Limiting references**

*This place does not cover:*

Guidance using head up displays or projectors, e.g. virtual vehicles or arrows projected on the windscreen or on the road itself	<a href="#">G01C 21/365</a>
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**Informative references**

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

The immediate route instructions are output to the driver, e.g. arrow signs for next turn	<a href="#">G08G 1/096861</a>
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**G01C 21/3638**

{including 3D objects and buildings (three dimensional [3D] modelling, e.g. data description of 3D objects [G06T 17/00](#); geographic models [G06T 17/05](#))}

**References****Informative references**

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

Three dimensional [3D] modelling, e.g. data description of 3D objects	<a href="#">G06T 17/00</a>
Geographic models	<a href="#">G06T 17/05</a>

**G01C 21/3641**

{Personalized guidance, e.g. limited guidance on previously travelled routes}

**Definition statement**

*This place covers:*

Details on guidance in navigation devices, systems or methods, wherein specific guidance adapted to the user is used, including user-defined guidance preferences relating to the manner of guidance, e.g. language, 2D/3D and guidance adapted to the instantaneous workload of the driver, considering also his mental and/or physical health.

**G01C 21/3647**

{Guidance involving output of stored or live camera images or video streams}

**Definition statement**

*This place covers:*

Details on guidance in navigation devices, systems or methods, wherein the guidance involves camera images, including images taken by a camera in the vehicle itself, by a camera in another vehicle, by a roadside camera, or by a camera in an aircraft or in a satellite.

**G01C 21/3658**

{Lane guidance}

**Definition statement**

*This place covers:*

Details on guidance in navigation devices, systems or methods, wherein the guidance takes road lanes into account, including showing a representation of an upcoming intersection including the pattern of the lanes.

## G01C 21/3664

{Details of the user input interface, e.g. buttons, knobs or sliders, including those provided on a touch screen; remote controllers; input using gestures}

### Definition statement

*This place covers:*

Details on the user-input interface in navigation devices, systems or methods, including e.g. touch-screen interfaces, remote controllers, gesture-based input, interfaces which disallow the driver to access certain functions, e.g. while driving, input using handwriting.

### References

#### Informative references

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

Gesture based interaction	<a href="#">G06F 3/017</a>
Interaction techniques for image manipulation, e.g. dragging, rotation	<a href="#">G06F 3/04845</a>
Interaction techniques involving entering handwritten data on touch screens	<a href="#">G06F 3/04883</a>

## G01C 21/3667

{Display of a road map ([G01C 21/3614](#) takes precedence; guidance using 3D or perspective road maps [G01C 21/3635](#))}

### Definition statement

*This place covers:*

Input/output arrangements in navigation devices, systems or methods focusing on the display of a road map, including also simplified map representing connections between nodes.

### References

#### Limiting references

*This place does not cover:*

Through interaction with a road map, e.g. selecting a POI icon on a road map	<a href="#">G01C 21/3614</a>
Guidance using 3D or perspective road maps	<a href="#">G01C 21/3635</a>

#### Informative references

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

Map spot or coordinate position indicators or map reading aids, using electronic means	<a href="#">G09B 29/106</a>
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## G01C 21/367

{Details, e.g. road map scale, orientation, zooming, illumination, level of detail, scrolling of road map or positioning of current position marker}

### References

#### Informative references

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

Interaction techniques for image manipulation, e.g. dragging, rotation	<a href="#">G06F 3/04845</a>
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## G01C 21/3673

{Labelling using text of road map data items, e.g. road names, POI names}

### Definition statement

*This place covers:*

Input/output arrangements in navigation devices, systems or methods focusing on the labelling using text on road map displays, including also the displaying of house numbers.

## G01C 21/3676

{Overview of the route on the road map}

### References

#### Informative references

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

The complete route is shown to the driver	<a href="#">G08G 1/096866</a>
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## G01C 21/3679

{Retrieval, searching and output of POI information, e.g. hotels, restaurants, shops, filling stations, parking facilities ([G01C 21/3611](#) takes precedence)}

### References

#### Limiting references

*This place does not cover:*

Destination input or retrieval	<a href="#">G01C 21/3605</a>
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#### Informative references

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

Location based services in a mobile phone network	<a href="#">H04W 4/02</a> , <a href="#">H04L 29/08657</a> , <a href="#">H04M 3/42348</a>
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## G01C 21/3682

{output of POI information on a road map ([G01C 21/3614](#), [G01C 21/3685](#) take precedence)}

### References

#### Limiting references

*This place does not cover:*

Through interaction with a road map, e.g. selecting a POI icon on a road map	<a href="#">G01C 21/3614</a>
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## G01C 21/3688

{Systems comprising multiple parts or multiple output devices (not client-server), e.g. detachable faceplates, key fobs or multiple output screens}

### Definition statement

*This place covers:*

Systems where multiple parts show a functional relationship (cooperation, synergy) between the part which remains in the vehicle and the portable part; this is different from the mechanical mounting of a mobile part to some part of a vehicle. The portable part must perform some navigation-related function on its own when taken out of the vehicle.

## G01C 21/3691

{Retrieval, searching and output of information related to real-time traffic, weather, or environmental conditions (arrangements for giving variable traffic instructions [G08G 1/09](#))}

### Definition statement

*This place covers:*

Input/output arrangements in navigation devices, systems or methods focusing on the processing of real-time traffic or weather information, including also traffic information sent from the vehicle to a server.

### References

#### Informative references

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

Arrangements for giving variable traffic instructions	<a href="#">G08G 1/09</a>
Arrangements for broadcast of traffic information	<a href="#">H04H 20/55</a>



## G01C 21/3697

{output of additional, non-guidance related information, e.g. low fuel level, fuel efficient driving, gear change, speeding, dangerous curve ahead, slippery road, school zone, speed traps, driving behaviour feedback, advertising, virtual billboards or road signs ([G01C 21/3679](#) takes precedence)}

### Definition statement

*This place covers:*

Output arrangements in navigation devices, systems or methods focusing on the output of specific information not related to guidance, e.g. low remaining fuel, fuel efficient driving, gear change, speeding, dangerous curve ahead, slippery road, traffic incident ahead, school zone, traffic cameras or road signs and including also advertisements displayed on maps or projected onto the landscape; providing information to the driver concerning his driving behaviour; warnings for speed traps.

### References

#### Informative references

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

Commerce, e.g. advertising	<a href="#">G06Q 30/02</a>
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## G01C 22/00

**Measuring distance traversed on the ground by vehicles, persons, animals, or other moving solid bodies, e.g. using odometers, using pedometers (counting mechanisms per se [G06M](#))**

### Definition statement

*This place covers:*

Devices and methods for measuring distance traversed on the ground by vehicles, persons, animals or other moving solid bodies, e.g. using pedometers, odometers including mechanical odometers.

### References

#### Informative references

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

Golf carts	<a href="#">A63B 55/60</a>
Tyres	<a href="#">B60C 23/00</a>
Indicating or recording positions or identities of vehicles or vehicle trains	<a href="#">B61L 25/02</a>
Hand-held measuring wheels for measuring distances on maps	<a href="#">G01B 3/12</a>
Resetting mechanisms	<a href="#">G01D 4/04</a>
Measuring tyre performance on wheel stands	<a href="#">G01M 17/00</a>
Anti tamper counters	<a href="#">G06M 3/12</a>
Taximeters	<a href="#">G07B 13/00</a>
Service reminders	<a href="#">G07C 5/006</a> , <a href="#">B60R 16/0234</a>
Stepping motors	<a href="#">H02P 8/00</a>

**G01C 22/002****{for cycles}****Definition statement***This place covers:*

The cycles can be monocycles, bicycles, tricycles or motorcycles.

**G01C 22/004****{for golf carts (wheeled carriers for golf bags [A63B 55/60](#))}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Wheeled carriers for golf bags	<a href="#">A63B 55/60</a>
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**G01C 22/006****{Pedometers}****References****Informative references***Attention is drawn to the following places, which may be of interest for search:*

Footwear	<a href="#">A43B 3/00</a>
Portable device for measuring pulse or heart rate	<a href="#">A61B 5/02438</a>
Electronic controls for exercising apparatus	<a href="#">A63B 24/00</a>

**G01C 22/008****{for skates}****Definition statement***This place covers:*

Devices and methods for measuring distance traversed on the ground, specially adapted for skates, including roller skates, in-line skates, ice skates, and skis.

**G01C 22/02****by conversion into electric waveforms and subsequent integration, e.g. using tachometer generator {([G01C 22/002](#), [G01C 22/004](#), [G01C 22/006](#) take precedence)}****Definition statement***This place covers:*

Odometers involving electrical or electronic components.

## References

### Limiting references

*This place does not cover:*

For cycles	<a href="#">G01C 22/002</a>
For golf carts	<a href="#">G01C 22/004</a>
Pedometers	<a href="#">G01C 22/006</a>
For skates	<a href="#">G01C 22/008</a>

### Informative references

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

Wheel hubs	<a href="#">B60B 27/00</a>
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## G01C 22/025

### {Differential odometers}

#### Definition statement

*This place covers:*

Systems in which direction (orientation, azimuth) is determined by measuring the distances traversed by wheels on either side of the vehicle, and taking the difference of these distances.

## G01C 23/00

**Combined instruments indicating more than one navigational value, e.g. for aircraft; Combined measuring devices for measuring two or more variables of movement, e.g. distance, speed, acceleration**

#### Definition statement

*This place covers:*

Devices, systems and methods for indicating more than one navigational value, e.g. position and azimuth, devices, systems and methods for measuring two or more variables of movement, e.g. distance, speed and acceleration

## References

### Informative references

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

Artificial horizons for aircraft	<a href="#">G01C 19/44</a> , <a href="#">G01C 19/32</a>
Arrangements for passenger entertainment, including display of navigation data using TV screens	<a href="#">B64D 11/0015</a>
Flight simulators	<a href="#">G09B 9/42</a>

## G01C 23/005

{Flight directors (indicating arrangements specially adapted for rotary gyroscopes [G01C 19/32](#); indicating or recording in connection with measuring, in general [G01D](#); control of course of land or air vehicles by controlling or regulating non-electric variables [G05D 1/00](#); arrangements or adaptations of instruments for aircraft [B64D 43/00](#))}

### Definition statement

*This place covers:*

Flight directors, i.e. devices which provide visual steering cues to the pilot for e.g. pitch , roll, yaw attitude controls to allow a pilot to manipulate the aircraft controls in a manner to keep the steering cues aligned with corresponding fixed symbols, in order to satisfy the pitch and roll attitude control laws so that the aircraft is maintained on a predetermined flight path.

### References

#### Limiting references

*This place does not cover:*

Indicating arrangements specially adapted for rotary gyroscopes	<a href="#">G01C 19/32</a>
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#### Informative references

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

Arrangements or adaptations of instruments for aircraft	<a href="#">B64D 43/00</a>
Indicating or recording in connection with measuring, in general	<a href="#">G01D</a>
Control of course of land or air vehicles by controlling or regulating non-electric variables	<a href="#">G05D 1/00</a>
Navigation or guidance aids for a single aircraft	<a href="#">G08G 5/0047</a>
Anti-collision systems for aircraft	<a href="#">G08G 5/04</a>

## G01C 25/00

Manufacturing, calibrating, cleaning, or repairing instruments and devices referred to in the preceding groups (testing, calibrating and compensating compasses [G01C 17/38](#))

### Definition statement

*This place covers:*

Devices and methods for manufacturing, calibrating, cleaning or repairing instruments and devices referred to in the preceding groups.

### References

#### Limiting references

*This place does not cover:*

Testing, calibrating and compensating compasses	<a href="#">G01C 17/38</a>
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