

**CPC****COOPERATIVE PATENT CLASSIFICATION****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](#))

**NOTES**

1. In this subclass, the following term is used with the meaning indicated:  
"navigation" means determining the position and course of land vehicles, ships, aircraft, and space vehicles.
2. Attention is drawn to the Notes following the title of class [G01](#).

**G01C 1/00**

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

[G01C 1/02](#)

- . Theodolites

[G01C 1/04](#)

- . . combined with cameras

[G01C 1/06](#)

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

[G01C 1/08](#)

- . Sextants

[G01C 1/10](#)

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

[G01C 1/12](#)

- . . . with a stabilised mirror (tilt compensation in general [G12B](#))

[G01C 1/14](#)

- . . Periscopic sextants (periscopes in general [G02B 23/08](#))

**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](#))

[G01C 3/02](#)

- . Details

[G01C 3/04](#)

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

[G01C 3/06](#)

- . . Use of electric means to obtain final indication

[G01C 3/08](#)

- . . . Use of electric radiation detectors

[G01C 3/085](#)

- . . . . {with electronic parallax measurement}

[G01C 3/10](#)

- . using a parallax 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](#))

[G01C 3/12](#)

- . . with monocular observation at a single point, e.g. coincidence type ([G01C 3/20](#) takes precedence)

- G01C 3/14 . . with binocular observation at a single point, e.g. stereoscopic type ([G01C 3/20 takes precedence](#))
- G01C 3/16 . . . Measuring marks
- G01C 3/18 . . with one observation point at each end of the base ([G01C 3/20 takes precedence](#))
- G01C 3/20 . . with adaptation to the measurement of the height of an object
- 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](#))
- 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](#))
- 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](#))
- G01C 3/28 . . with provision for reduction of the distance into the horizontal plane
- G01C 3/30 . . . with adaptation to the measurement of the height of an object, e.g. tachometers
- G01C 3/32 . by focusing the object, e.g. on a ground glass screen
- 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](#))
- G01C 5/005 . {altimeters for aircraft ([G01C 5/02, G01C 5/06 take precedence](#))}
- G01C 5/02 . involving automatic stabilisation of the line of sight; ([tilt compensation in general G12B](#); [regulation of direction in general G05D 3/00](#))
- G01C 5/04 . Hydrostatic levelling, i.e. by flexibly interconnected liquid containers at separated points
- G01C 5/06 . by using barometric means ([barometers per se G01L](#))
- G01C 7/00** **Tracing profiles** ([by photogrammetry G01C 11/00](#))
- G01C 7/02 . of land surfaces
- G01C 7/04 . . involving a vehicle which moves along the profile to be traced
- G01C 7/06 . of cavities, e.g. tunnels ([survey of wells E21B 47/00](#))
- G01C 9/00** **Measuring inclination, e.g. by clinometers, by levels** {(switches operated by inclination or orientation [H01H 35/02](#))}
- G01C 9/005 . {specially adapted for use in aircraft}
- G01C 9/02 . Details
- G01C 9/04 . . Transmission means between sensing element and final indicator for giving an enlarged reading
- G01C 9/06 . . Electric or photoelectric indication or reading means
- G01C 2009/062 . . . {capacitive}
- G01C 2009/064 . . . {inductive}
- G01C 2009/066 . . . {optical}

- G01C 2009/068 . . . {resistive}
- G01C 9/08 . . Means for compensating acceleration forces due to movement of instrument
- G01C 9/10 . . by using rolling bodies {e.g. spheres, cylinders, mercury droplets (tilting mercury container switches [H01H 29/20](#))}
- G01C 2009/102 . . {cylinders}
- G01C 2009/105 . . {mercury droplets}
- G01C 2009/107 . . {spheres}
- G01C 9/12 . . by using a single pendulum (plumb lines [G01C 15/10](#))
- G01C 9/14 . . movable in more than one direction
- G01C 9/16 . . by using more than one pendulum
- G01C 9/18 . . by using liquids
- G01C 2009/182 . . {conductive}
- G01C 2009/185 . . {dielectric}
- G01C 2009/187 . . {magnetic, e.g. ferromagnetic}
- G01C 9/20 . . the indication being based on the inclination of the surface of a liquid relative to its container
- G01C 9/22 . . . with interconnected containers in fixed relation to each other
- G01C 9/24 . . in closed containers partially filled with liquid so as to leave a gas bubble
- G01C 9/26 . . . Details
- G01C 9/28 . . . . Mountings
- G01C 9/30 . . . . Means for adjusting dimensions of bubble
- G01C 9/32 . . . . Means for facilitating the observation of the position of the bubble, e.g. illuminating means
- G01C 9/34 . . . of the tubular type, i.e. for indicating the level in one direction only
- G01C 9/36 . . . of the spherical type, i.e. for indicating the level in all directions

**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](#))

### **WARNING**

The following IPC group is not used in the CPC scheme: Subject-matter covered by this group is classified in the following CPC groups: [G01C 11/36](#) covered by [G01C 11/00](#) to [G01C 11/34](#)

- G01C 11/02 . . Picture taking arrangements specially adapted for photogrammetry or photographic surveying, e.g. controlling overlapping of pictures
- G01C 11/025 . . {by scanning the object}
- G01C 11/04 . . Interpretation of pictures
- G01C 11/06 . . by comparison of two or more pictures of the same area
- G01C 11/08 . . . the pictures not being supported in the same relative position as when they were taken
- G01C 11/10 . . . . using computers to control the position of the pictures (computers per se [G06](#))

- G01C 11/12 . . . the pictures being supported in the same relative position as when they were taken
- G01C 11/14 . . . . with optical projection ([G01C 11/26 takes precedence](#))
- G01C 11/16 . . . . . in a common plane
- G01C 11/18 . . . . . involving scanning means
- G01C 11/20 . . . . . in separate planes
- G01C 11/22 . . . . with mechanical projection ([G01C 11/26 takes precedence](#))
- G01C 11/24 . . . . with optical-mechanical projection ([G01C 11/26 takes precedence](#))
- G01C 11/26 . . . . using computers to control the position of the pictures ([computers per se G06](#))
- G01C 11/28 . . . Special adaptation for recording picture point data, e.g. for profiles
- G01C 11/30 . . by triangulation
- G01C 11/32 . . . Radial triangulation
- G01C 11/34 . . . Aerial triangulation
- G01C 2011/36 . {Videogrammetry, i.e. electronic processing of video signals from a single source or from different sources to give parallax or range information}

#### **WARNING**

This group it is currently not used for classification purpose in ECLA. Subject-matter covered by the IPC group [G01C 11/36](#) is rather classified in the following CPC groups: [G01C 11/00](#) to [G01C 11/34](#)

- G01C 13/00** **Surveying specially adapted to open water, e.g. sea, lake, river, canal** (liquid level metering [G01E](#); measuring liquid velocity [G01P](#); determining existence of flow of underground water [G01V](#))
- G01C 13/002 . {Measuring the movement of open water}
- G01C 13/004 . . {vertical movement}
- G01C 13/006 . . {horizontal movement}
- G01C 13/008 . {measuring depth of open water}
- G01C 15/00** **surveying instruments or accessories not provided for in groups [G01C 1/00](#) to [G01C 13/00](#)**
- G01C 15/002 . {Active optical surveying means (optical plumbing [G01C 15/105](#))}
- G01C 15/004 . . {Reference lines, planes or sectors}
- G01C 15/006 . . . {Detectors therefor}
- G01C 15/008 . . {combined with inclination sensor}
- G01C 15/02 . Means for marking measuring points
- G01C 15/04 . . Permanent marks; Boundary markers
- G01C 15/06 . . Surveyors' staffs; Movable markers
- G01C 15/08 . . . Plumbing or registering staffs or markers over ground marks
- G01C 15/10 . Plumb lines
- G01C 15/105 . . {Optical plumbing}
- G01C 15/12 . Instruments for setting out fixed angles, e.g. right angles

G01C 15/14	<ul style="list-style-type: none"> <li>Artificial horizons (<a href="#">tilt compensation in general G02B</a>)</li> </ul>
<b>G01C 17/00</b>	<b>Compasses; Devices for ascertaining true or magnetic north for navigation or surveying purposes</b> ( <a href="#">using gyroscopic effect G01C 19/00</a> ; for geophysical or prospecting purposes <a href="#">G01V 3/00</a> )
G01C 17/02	<ul style="list-style-type: none"> <li>Magnetic compasses</li> </ul>
G01C 17/04	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>with north-seeking magnetic elements, e.g. needles</li> </ul> </li> </ul>
G01C 17/06	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Suspending magnetic elements</li> </ul> </li> </ul> </li> </ul>
G01C 17/08	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>by flotation</li> </ul> </li> </ul> </li> </ul>
G01C 17/10	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Comparing observed direction with north indication</li> </ul> </li> </ul>
G01C 17/12	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>by sighting means, e.g. for surveyors' compasses</li> </ul> </li> </ul>
G01C 17/14	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>by reference marks, e.g. for ships' compasses</li> </ul> </li> </ul>
G01C 17/16	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>by clinometers, e.g. for determining dip or strike of geological strata</li> </ul> </li> </ul>
G01C 17/18	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Supporting or suspending compasses, e.g. by gimbal, by flotation</li> </ul> </li> </ul>
G01C 17/20	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Observing the compass card or needle</li> </ul> </li> </ul>
G01C 17/22	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>by projection</li> </ul> </li> </ul>
G01C 17/24	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Illumination</li> </ul> </li> </ul>
G01C 17/26	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>using electric pick-offs for transmission to final indicator, e.g. photocell</li> </ul> </li> </ul>
G01C 17/28	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Electromagnetic compasses (<a href="#">with north seeking magnetic elements and having electric pick-offs G01C 17/26</a>)</li> </ul> </li> </ul>
G01C 17/30	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Earth-inductor compasses</li> </ul> </li> </ul>
G01C 17/32	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Electron compasses</li> </ul> </li> </ul>
G01C 17/34	<ul style="list-style-type: none"> <li>Sun- and astro-compasses</li> </ul>
G01C 17/36	<ul style="list-style-type: none"> <li>Repeaters for remote indication of readings of a master compass</li> </ul>
G01C 17/38	<ul style="list-style-type: none"> <li>Testing, calibrating, or compensating of compasses</li> </ul>
<b>G01C 19/00</b>	<b>Gyroscopes; Turn-sensitive devices using vibrating masses; Turn-sensitive devices without moving masses; Measuring angular rate using gyroscopic effects</b>
G01C 19/02	<ul style="list-style-type: none"> <li>Rotary gyroscopes</li> </ul>
G01C 19/025	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{<a href="#">Special arrangements for gyros functioning during a short period</a>}</li> </ul> </li> </ul>
G01C 19/04	<ul style="list-style-type: none"> <li>Details</li> </ul>
G01C 19/06	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Rotors</li> </ul> </li> </ul>
G01C 19/065	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>{<a href="#">Measurement or control of angular velocity, specifically adapted to gyrorotors (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>)</a>}</li> </ul> </li> </ul> </li> </ul>
G01C 19/08	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>electrically driven (<a href="#">G01C 19/14</a> takes precedence; dynamoelectric machines <a href="#">H02K</a>)</li> </ul> </li> </ul>
G01C 19/10	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Power supply</li> </ul> </li> </ul> </li> </ul>
G01C 19/12	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>fluid driven (<a href="#">G01C 19/14</a> takes precedence)</li> </ul> </li> </ul>
G01C 19/14	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Fluid rotors</li> </ul> </li> </ul>
G01C 19/16	<ul style="list-style-type: none"> <li> <ul style="list-style-type: none"> <li>Suspensions; Bearings (<a href="#">bearings in general F16C</a>; balancing rotors <a href="#">G01M</a>)</li> </ul> </li> </ul>

- G01C 19/18 . . . . providing movement of rotor with respect to its rotational axes ([G01C 19/20](#), [G01C 19/24](#) takes precedence)
- G01C 19/20 . . . . in fluid
- G01C 19/22 . . . . torsional
- G01C 19/24 . . . . using magnetic or electrostatic fields
- G01C 19/26 . . . . Caging, i.e. immobilising moving parts, e.g. for transport ([applicable to instruments in general G01D 11/20](#))
- G01C 19/28 . . . . Pick-offs, i.e. devices for taking-off an indication of the displacement of the rotor axis
- G01C 19/30 . . . . Erection devices, i.e. devices for restoring rotor axis to a desired position ([for instrument indicating the vertical G01C 19/46](#))
- G01C 19/32 . . . . Indicating or recording means specially adapted for rotary gyroscopes ([in general G01D](#))
- G01C 19/34 . . . . for indicating a direction in the horizontal plane, e.g. directional gyroscopes
- G01C 19/36 . . . . with north-seeking action by magnetic means, e.g. gyromagnetic compasses
- G01C 19/38 . . . . with north-seeking action by other than magnetic means, e.g. gyrocompasses using earth's rotation
- G01C 19/40 . . . . for control by signals from a master compass, i.e. repeater compasses
- G01C 19/42 . . . . for indicating rate of turn; for integrating rate of turn
- G01C 19/44 . . . . for indicating the vertical
- G01C 19/46 . . . . Erection devices for restoring rotor axis to a desired position
- G01C 19/48 . . . . . operating by electrical means ([G01C 19/54](#) takes precedence)
- G01C 19/50 . . . . . operating by mechanical means ([G01C 19/54](#) takes precedence)
- G01C 19/52 . . . . . operating by fluid means ([G01C 19/54](#) takes precedence)
- G01C 19/54 . . . . . with correction for acceleration forces due to movement of instrument
- G01C 19/56 . . . . Turn-sensitive devices using vibrating masses, e.g. vibratory angular rate sensors based on Coriolis forces

#### **NOTE**

Attention is drawn to the Notes following the titles of class [B81](#) and subclass [B81B](#) relating to "micro-structural devices" and "micro-structural systems"

- G01C 19/5607 . . . . using vibrating tuning forks ([double-ended tuning forks using planar vibrating masses suspended at opposite ends G01C 19/5719](#))
- G01C 19/5614 . . . . Signal processing
- G01C 19/5621 . . . . the devices involving a micro-mechanical structure
- G01C 19/5628 . . . . Manufacturing; Trimming; Mounting; Housings
- G01C 19/5635 . . . . using vibrating wires or strings
- G01C 19/5642 . . . . using vibrating bars or beams
- G01C 19/5649 . . . . Signal processing
- G01C 19/5656 . . . . the devices involving a micro-mechanical structure
- G01C 19/5663 . . . . Manufacturing; Trimming; Mounting; Housings
- G01C 19/567 . . . . using the phase shift of a vibration node or antinode

- G01C 19/5677 . . . of essentially two-dimensional vibrators, e.g. ring-shaped vibrators
- G01C 19/5684 . . . . the devices involving a micro-mechanical structure
- G01C 19/5691 . . . of essentially three-dimensional vibrators, e.g. wine glass-type vibrators
- G01C 19/5698 . . using acoustic waves, e.g. surface acoustic wave gyros
- G01C 19/5705 . . using masses driven in reciprocating rotary motion about an axis
- G01C 19/5712 . . . the devices involving a micro-mechanical structure
- G01C 19/5719 . . using planar vibrating masses driven in a translation vibration along an axis
- G01C 19/5726 . . . Signal processing
- G01C 19/5733 . . . Structural details or topology
- G01C 19/574 . . . . the devices having two sensing masses in anti-phase motion
- G01C 19/5747 . . . . . each sensing mass being connected to a driving mass, e.g. driving frames
- G01C 19/5755 . . . . the devices having a single sensing mass
- G01C 19/5762 . . . . . the sensing mass being connected to a driving mass, e.g. driving frames
- G01C 19/5769 . . . Manufacturing; Mounting; Housings
- G01C 19/5776 . . Signal processing not specific to any of the devices covered by groups [G01C 19/5607](#) to [G01C 19/5719](#)
- G01C 19/5783 . . Mountings or housings not specific to any of the devices covered by groups [G01C 19/5607](#) to [G01C 19/5719](#)
- G01C 19/58 . Turn-sensitive devices without moving masses
- G01C 19/60 . . Electronic or nuclear magnetic resonance gyrometers ([magnetic resonance arrangements in general G01R 33/20](#))
- G01C 19/62 . . . with optical pumping
- G01C 19/64 . . Gyrometers using the Sagnac effect, i.e. rotation-induced shifts between counter-rotating electromagnetic beams
- G01C 19/66 . . . Ring laser gyrometers ([ring lasers in general H01S 3/083](#))
- G01C 19/661 . . . . {details}
- G01C 19/662 . . . . . {signal readout; dither compensators}
- G01C 19/664 . . . . . {means for removing the dither signal}
- G01C 19/665 . . . . . {control of the cavity (of lasers in general [H01S 3/10](#))}
- G01C 19/667 . . . . {using a multioscillator ring laser}
- G01C 19/668 . . . . {Assemblies for measuring along different axes, e.g. triads}
- G01C 19/68 . . . . Lock-in prevention
- G01C 19/70 . . . . . by mechanical means
- G01C 19/72 . . . with counter-rotating light beams in a passive ring, e.g. fibre laser gyrometers
- G01C 19/721 . . . . {Details}
- G01C 19/722 . . . . . {of the mechanical construction}
- G01C 19/723 . . . . {Heterodyning fibre optic gyrometers}
- G01C 19/725 . . . . {using nxn optical couplers, e.g. 3x3 couplers}
- G01C 19/726 . . . . {Phase nulling gyrometers, i.e. compensating the Sagnac phase shift in a closed loop system}
- G01C 19/727 . . . . {using a passive ring resonator}



- G01C 19/728 . . . . {Assemblies for measuring along different axes, e.g. triads}
- 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](#))
- G01C 21/005 . {with correlation of navigation data from several sources, e.g. map or contour matching ([G01C 21/30](#) takes precedence)}
- 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](#))
- G01C 21/025 . . {with the use of startrackers}
- G01C 21/04 . by terrestrial means ([G01C 21/24](#), [G01C 21/26](#) take precedence; marking of navigation route for ships [B63B 51/00](#))
- G01C 21/06 . . involving measuring of drift angle; involving correction for drift
- G01C 21/08 . . involving use of the magnetic field of the earth
- G01C 21/10 . by using measurements of speed or acceleration ([G01C 21/24](#), [G01C 21/26](#) take precedence)
- G01C 21/12 . . . . . executed aboard the object being navigated; Dead reckoning
- G01C 21/14 . . . . . by recording the course traversed by the object ([G01C 21/16](#) takes precedence)
- G01C 21/16 . . . . . by integrating acceleration or speed, i.e. inertial navigation
- G01C 21/165 . . . . . {combined with non-inertial navigation instruments}
- G01C 21/18 . . . . . Stabilised platforms, e.g. by gyroscope
- 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](#))
- G01C 21/203 . . {Specially adapted for sailing ships}
- G01C 21/206 . . {specially adapted for indoor navigation}
- G01C 21/22 . . Plotting boards (in general [B43L](#))
- G01C 21/24 . specially adapted for cosmonautical navigation
- G01C 21/26 . specially adapted for navigation in a road network
- G01C 21/265 . . {constructional aspects of navigation devices, e.g. housings, mountings, displays ([G01C 21/3688](#) takes precedence)}
- G01C 21/28 . . with correlation of data from several navigational instruments
- G01C 21/30 . . . . Map- or contour-matching
- G01C 21/32 . . . . Structuring or formatting of map data
- G01C 21/34 . . Route searching; Route guidance
- G01C 21/3407 . . . . {specially adapted for specific applications}
- 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}
- G01C 21/3423 . . . . {Multimodal routing, i.e. combining two or more modes of transportation, where the modes can be any of e.g. driving, walking, cycling, public transport}



G01C 21/343	. . . .	{Calculating itineraries, i.e. routes leading from a starting point to a series of categorical destinations using a global route restraint, round trips, touristic trips (travelling salesman problem <a href="#">G06Q 10/04</a> ; optimisation of routes <a href="#">G06Q 10/047</a> )}
G01C 21/3438	. . . .	{Rendez-vous, i.e. searching a destination where several users can meet, and the routes to this destination for these users; Ride sharing, i.e. searching a route such that at least two users can share a vehicle for at least part of the route}
G01C 21/3446	. . . .	{Details of route searching algorithms, e.g. Dijkstra, A*, arc-flags, using precalculated routes}
G01C 21/3453	. . . .	{Special cost functions, i.e. other than distance or default speed limit of road segments}
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}
G01C 21/3469	. . . .	{Fuel consumption; Energy use; Emission aspects}
G01C 21/3476	. . . .	{using point of interest [POI] information, e.g. a route passing visible POIs}
G01C 21/3484	. . . .	{Personalized, e.g. from learned user behaviour or user-defined profiles}
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 <a href="#">G08G 1/0968</a> )}
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 <a href="#">G06F 3/00</a> ; pointing devices displaced or positioned by the user, e.g. mice, trackballs, pens or joysticks, and accessories therefor <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> )}
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 <a href="#">G06T</a> )}
G01C 21/3605	. . . .	{Destination input or retrieval}
G01C 21/3608	. . . .	{using speech input, e.g. using speech recognition (speech recognition per se <a href="#">G10L 15/00</a> )}
G01C 21/3611	. . . .	{using character input or menus, e.g. menus of POIs (character input methods in general <a href="#">G06F 3/0233</a> )}
G01C 21/3614	. . . .	{through interaction with a road map, e.g. selecting a POI icon on a road map}
G01C 21/3617	. . . .	{using user history, behaviour, conditions or preferences, e.g. predicted or inferred from previous use or current movement}
G01C 21/362	. . . .	{received from an external device or application, e.g. PDA, mobile phone or calendar application}
G01C 21/3623	. . . .	{using a camera or code reader, e.g. for optical or magnetic codes}
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 <a href="#">G08G 1/0968</a> )}

G01C 21/3629	. . . . .	{Guidance using speech or audio output, e.g. text-to-speech ( <a href="#">text to speech systems per se G10L 13/00</a> )}
G01C 21/3632	. . . . .	{Guidance using simplified or iconic instructions, e.g. using arrows ( <a href="#">G01C 21/365 takes precedence</a> )}
G01C 21/3635	. . . . .	{Guidance using 3D or perspective road maps}
G01C 21/3638	. . . . .	{including 3D objects and buildings (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}
G01C 21/3644	. . . . .	{Landmark guidance, e.g. using POIs or conspicuous other objects}
G01C 21/3647	. . . . .	{Guidance involving output of stored or live camera images or video streams}
G01C 21/365	. . . . .	{Guidance using head up displays or projectors, e.g. virtual vehicles or arrows projected on the windscreen or on the road itself}
G01C 21/3652	. . . . .	{Guidance using non-audiovisual output, e.g. tactile, haptic or electric stimuli}
G01C 21/3655	. . . . .	{Timing of guidance instructions}
G01C 21/3658	. . . . .	{Lane guidance}
G01C 21/3661	. . . . .	{Guidance output on an external device, e.g. car radio}
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}
G01C 21/3667	. . . . .	{Display of a road map ( <a href="#">G01C 21/3614 takes precedence</a> ; guidance using 3D or perspective road maps <a href="#">G01C 21/3635</a> )}
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}
G01C 21/3673	. . . . .	{Labelling using text of road map data items, e.g. road names, POI names}
G01C 21/3676	. . . . .	{Overview of the route on the road map}
G01C 21/3679	. . . . .	{Retrieval, searching and output of POI information, e.g. hotels, restaurants, shops, filling stations, parking facilities ( <a href="#">G01C 21/3611 takes precedence</a> )}
G01C 21/3682	. . . . .	{output of POI information on a road map ( <a href="#">G01C 21/3614</a> , <a href="#">G01C 21/3685 take precedence</a> )}
G01C 21/3685	. . . . .	{the POI's being parking facilities}
G01C 21/3688	. . . . .	{Systems comprising multiple parts or multiple output devices (not client-server), e.g. detachable faceplates, key fobs or multiple output screens}
G01C 21/3691	. . . . .	{Retrieval, searching and output of information related to real-time traffic, weather, or environmental conditions ( <a href="#">arrangements for giving variable traffic instructions G08G 1/09</a> )}
G01C 21/3694	. . . . .	{Output thereof on a road map}
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 ( <a href="#">G01C 21/3679 takes precedence</a> )}

- 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](#))**
- G01C 22/002      .    {for cycles}
  - G01C 22/004      .    {for golf carts (wheeled carriers for golf bags [A63B 55/60](#))}
  - G01C 22/006      .    {Pedometers}
  - G01C 22/008      .    {for skates}
  - 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)}
  - G01C 22/025      .    .    {Differential odometers}
- 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**
- 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](#))}
- 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](#))**
- G01C 25/005      .    {initial alignment, calibration or starting-up of inertial devices}