90.14 - Direction finding compasses; other navigational instruments and appliances.

9014.10 - Direction finding compasses

9014.20 - Instruments and appliances for aeronautical or space navigation (other than compasses)

9014.80 - Other instruments and appliances

9014.90 - Parts and accessories

(I) DIRECTION FINDING COMPASSES

This group covers all types of direction finding compasses, from the simple types used by hikers, cyclists, etc., to those specialised for use in mining, navigation, etc., (including magnetic compasses, gyroscopic compasses, gyromagnetic compasses, binnacle compasses, position finding compasses, etc.).

(II) OTHER NAVIGATIONAL INSTRUMENTS AND APPLIANCES

This group includes :

(A) **Instruments for the determination of a ship's position**, such as sextants, octants, azimuths, etc.

(B) **Other special marine or river navigational instruments**, for example :

(1) **Automatic pilots (Gyro pilots)**. These are complex units which control the ship's rudder in relation to the readings of a gyroscopic compass.

(2) **Course recording apparatus**. These give an accurate record of the course (and any changes of course) during a ship's journey.

(3) **Inclinometers**; for measuring rolling.

(4) **Logs**. These indicate the speed of a ship by measuring the apparent distance covered in a given time. Nowadays, these instruments are always automatic. One type operates by means of a **screw** or propeller (a screw is mounted in the ship's stream and is connected to a dial on board the ship). Another type is based on the **principle of differential pressure**, the pressure varying according to the speed of the stream (they generally comprise a Pitot tube); the distance and speed is read on a dial on board the ship.

The heading also covers logs incorporating a counter which records the number of times an electric circuit is broken (i.e., the number of revolutions of the log), thus showing the distance covered by the ship.

(5) **Sounding leads** (hand leads and winch-operated deep-sea leads), which determine the depth of the water and the nature of the sea bed.

(6) **Echo sounding instruments**. An audible echo returned by the sea bed is detected on board ship by a very sensitive microphone, and read on a galvanometer.

(7) **Ultrasonic sounding or detecting equipment**, for example, asdic, sonar or the like, used for normal sounding operations, for mapping the sea bed, for detecting submarines, wrecks, shoals of fish, etc.

(C) **Special instruments for air navigation**, such as :

(1) **Altimeters**. A type of barometer calibrated in height units and based on the fact that atmospheric pressure decreases with altitude.

(2) **Air speed indicators**. These operate by differential pressure measurements of the aircraft's slipstream, and show the speed of the aircraft in relation to the surrounding air.

(3) **Climbing or diving speed indicators**. These show the vertical speed of descent or ascent of the aircraft, by means of a differential pressure gauge.

(4) **Artificial horizons or gyro-horizons and turning and banking indicators**. These are based on gyroscopic principles, the former indicating the angle of the aircraft by reference to the transversal or longitudinal axis, and the latter by reference to the vertical axis.

(5) **Mach-meters**. These indicate the ratio between the air speed and the local speed of sound. The ratio is expressed as a " Mach number ".

(6) **Accelerometers**. These determine the maximum limit (not to be exceeded) of the inert forces produced by acceleration during high-speed evolutions.

(7) **Automatic pilots**. This apparatus temporarily replaces the pilot by controlling the equilibrium and flight of the aircraft in accordance with a pre-established setting (altitude, course, etc.). It consists chiefly of direct-operated or servo-motor controls (usually hydraulic motors which replace the pilot's movements), and of automatic acting apparatus (high-speed gyroscopes) which co-ordinate instrument readings and the action of the servo-motors.

PARTS AND ACCESSORIES

Subject to the provisions of Notes 1 and 2 to this Chapter (see the General Explanatory Note), parts and accessories of apparatus or appliances of this heading remain classified here.

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This heading also **excludes** :

(a) Radar apparatus, radio navigational aid apparatus, e.g., global positioning system (GPS) receivers, and radio remote control apparatus (**heading 85.26**).

(b) Pantographs and eidographs, used for course plotting in navigation (**heading 90.17**).

(c) Barometers and thermometers (including reversible thermometers for underwater research) (**heading 90.25**).

(d) Pressure gauges, liquid level indicators and other instruments of **heading 90.26**.

(e) Revolution counters (**heading 90.29**).

(f) Ammeters, voltmeters and other apparatus for measuring or checking electrical quantities of **heading 90.30**.

(g) Marine chronometers and time-keepers (**Chapter 91**).